

Fact Sheet

RIPPER BUCKET FOR DIGGING HARD AND FROZEN GROUND

PROBLEM

Engineer units must be able to dig and excavate as part of general operational and tactical activities, including construction of fighting positions and obstacles. Therefore, digging seasonally frozen ground can be a significant problem even for some heavy units, since their most effective tool, the D-7 tractor with ripper, is no longer available except in certain designated units in the Army National Guard (ARNG). Existing equipment for this task, the Small Emplacement Excavator (SEE) with standard bucket, and the Armored Combat Earthmover (ACE), both have problems penetrating frozen ground.

SOLUTION

A ripper bucket of special design and size, based on U.S. Army Cold Regions Research and Engineering Laboratory (CRREL) criteria developed and used for design and selection of tools for drilling and excavating frozen ground, is now available.

During field demonstrations, the Army SEE fitted with the ripper bucket excavated frozen ground at sites where the frozen surface layer could not be penetrated using the standard bucket. Consideration of tooth configuration and excavation techniques also increased performance in frozen soils.



SEE equipped with ripper bucket.

RESULTS

This effort has been coordinated with the U.S. Army Engineer School at Fort Leonard Wood, Missouri, and has been successfully demonstrated to troop units with excavation problems caused by hard or frozen ground. The 41st Engineer Battalion at Fort Drum, New York, has 21 ripper buckets and finds them to be a major enhancement to digging in frozen and hard soils, as well as ripping up asphalt. There are seven of these buckets in USAREUR.

The ripper bucket is available by ordering NSN 3830-361-8209, cage and part # 12177-020-1898, from the Defense Construction Supply Center (DCSC), Columbus, Ohio 43216.

PRODUCTS

Report: Digging Frozen Ground with a Ripper Bucket, by Paul V. Sellmann and Bruce E. Brockett, U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire, Special Report 92-15.

Video: Ripper Bucket for the SEE (Tape T96001; 4 minutes, 44 seconds; available to .mil addresses or military postal mail addresses; available in VHS only.) Demonstrates the ability of a SEE equipped with a bucket modified with ripper teeth to effectively dig in frozen or stony ground, and describes procedures for using the ripper bucket.

To order report or video, contact CRREL Librarian (Elizabeth.R. Hoffmeister@erdc.usace.army.mil); 1-603-646-4338/DSN 220-4338). Please specify title and tape number, if applicable.

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